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Mr. James Saric
Remedial Project Manager
USEPA Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60605-3507

SEDIMENTS

Subject:
Kalamazoo River SRI Phase 2 Core Analyses – Focused Step-out Sampling – Crown Vantage Landfill to Plainwell No. 2 Dam

Date:
April 16, 2009

Contact:
Michael J. Erickson

Phone:
810.225.1924

Email:
michael.erickson@arcadis-us.com

Our ref:
B0064539.500

Dear Mr. Saric:

In fall of 2007, ARCADIS completed reconnaissance work at five previously sampled locations between Crown Vantage Landfill and Plainwell No. 2 Dam. This effort, which was carried out as part of the Phase 1 investigation outlined in Section 3.4.4 of the *Supplemental Remedial Investigation/Feasibility Study Work Plan – Morrow Dam to Plainwell* (Area 1 SRI/FS Work Plan) (ARCADIS BBL 2007a), was designed to characterize the size and orientation of potential sediment deposits at each of these five locations. The second phase of sampling at these deposits is based on the presence and characteristics of the deposit or geomorphologic feature. If such deposits are not present, Phase 2 sampling is unnecessary. If a deposit or associated geomorphic feature is present, the approach to sampling that area in Phase 2 depends on its characteristics.

The results of the fall 2007 reconnaissance are presented below. In summary, of the five locations reconnoitered in Phase 1, a deposit was observed at only one of these, the location of a small depression leading to the Kalamazoo River. The Phase 2 sampling approach for that location is described in this plan for the United States Environmental Protection Agency (USEPA) review and approval.

Phase 1 Investigation Summary

The sample IDs and maximum polychlorinated biphenyl (PCB) concentration previously detected at each of the five locations reconnoitered in Phase 1 per the Area 1 SRI/FS Work Plan are listed below:

CH2M HILL COMMENTS ON THE KALAMAZOO RIVER SRI PHASE 2 CORE ANALYSES – FOCUSED STEP-OUT SAMPLING – CROWN VANTAGE LANDFILL AREA RESPONSE TO COMMENTS ALLIED PAPER, INC/PORTAGE CREEK/KALAMAZOO RIVER SITE

SPECIFIC COMMENTS

Commenting Organization: CH2M HILL Commentor: CH2M HILL
Section: Core Collection and Analysis Page #: 3/4 Lines #: N/A

Samples for grain size should not be frozen.

ARCADIS Response: Throughout the SRI/FS Area 1 Work Plan (as approved by USEPA) samples are held in frozen storage and later submitted for analysis, including grain size. Continued use of this handling method is therefore consistent with prior work and handling procedures and will be retained.

CH2M HILL: During the March 16 teleconference ARCADIS agreed not to freeze cores for grain size analysis. Although previous grain size samples may have been frozen, this is inconsistent with the October 2007 Field Sampling Plan Standard Operating Procedure F-14 which addresses freezing of samples for PCB analysis and biota only.

Table 1 Maximum PCB at Focused Step-out Locations

Sample ID	Maximum PCB (mg/kg)	Depth Interval of Maximum (inches)
FF-32 (soil)	2.2	0 - 6
FF-35 (sediment)	8.2	2 - 6
FF-37 (soil)	5.1	0 - 6
FF-40 (soil)	5.9	6 - 12
FF-42 (soil)	2.7	0 - 6

Notes:
1. mg/kg = milligrams per kilogram.
2. PCB = polychlorinated biphenyls.

During the fall 2007 reconnaissance, none of the four focused soil sample locations in Table 1 were observed to represent distinct local depositional features. The four soil locations—FF-32, FF-37, FF-40, and FF-42—occurred in low-lying areas adjacent to the river, and there was nothing anomalous or unique to distinguish the sample material from the surrounding area. The local topography and ground surface characteristics of these four locations did not suggest the samples represented any discernable depositional feature or soil deposit present at those locations. Therefore, based on the lack of such features, no further sampling is proposed for these four locations.

The sediment sample location (FF-35) was located in a small depression along the bank protected from the main flow of the river. Although the sediment did not exhibit unique or well-defined materials during probing activities, the local topography and air photos reveal a swale-like depression leading to the river at this location. This area appears to contain sediments that may be exposed depending on river level (i.e., during low flow conditions) and location along this feature. The approach to sampling this area in Phase 2 is described below.

Sampling Locations

At FF-35, core samples will be collected around the original sample location using a systematic layout aligned with the swale-like feature. Two "tiers" of core samples will be collected. For the first tier, one core will be collected from the original location,

four cores will be collected at 10-foot step-outs from the center sample location in all four directions, and two additional cores will be collected at 20-foot step outs from the original sample location, along the approximate centerline of the swale. This first tier of cores will be segmented and analyzed immediately after collection. Proposed sample locations are shown on Figure 1.

A second tier of four cores, as shown on Figure 1, will be collected along the orientation of the swale-like feature. The two step-out cores in each direction along the swale-like feature will be collected at 40-feet and 60-feet, respectively. These additional core samples will be temporarily held in frozen storage and analyzed only if the PCB concentration in the adjacent 20-foot step-out sample is above 2 milligrams per kilogram (mg/kg). This threshold concentration was selected for purposes of characterizing this step-out location based on the lowest maximum PCB concentration among the five samples targeted in Phase 1, which occurred at location FF-32 (2.21 mg/kg).

Core Collection and Analysis

All core samples will be processed and analyzed in accordance with the methods and protocols described in the USEPA-approved Area 1 SRI/FS Work Plan (ARCADIS BBL 2007a) and Multi-Area Field Sampling Plan (ARCADIS BBL 2007b), as well as prior-practice for sample handling and core sectioning for investigatory work completed pursuant to the Work Plan. It is assumed that the proposed core sample locations are representative of sediments. Upon observation of conditions in the field at the time of sampling in consultation with Agency oversight personnel, if any of the proposed locations are clearly representative of floodplain soils rather than sediments, they will be classified as floodplain soil samples. Soil cores will be collected and sectioned into 0- to 6- and 6- to 12-inch intervals and subsequent 1-foot intervals to the bottom of the core. Sediment cores will be segmented into 0 to 2-, 2 to 6-, 6 to 12-inch intervals and subsequent 1-foot intervals to the bottom of the core. Core sectioning intervals will be varied from the above specifications as necessary to represent visually-distinct strata, where present. All samples will be submitted for PCB, total organic carbon, and particle size distribution analysis.

KALAMAZOO RIVER STUDY GROUP
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

RESPONSE TO COMMENTS ON THE PROPOSED SRI PHASE 2 CORE ANALYSES FOCUSED STEP-OUT SAMPLING PLAN FOR THE KALAMAZOO RIVER FROM CROWN VANTAGE LANDFILL TO PLAINWELL NO. 2 DAM

USEPA (CH2MHILL) COMMENTS

CH2M Hill Original Specific Comment #1:
Section: Sampling Strategy Page #: 3/4
The first sentence of the third paragraph should be revised to indicate that 30-foot step-outs will be collected "at FF-32, FF-37, FF-40, and FF-42", instead of "at each location".

Response: ***Based upon discussion with USEPA and MDEQ during the March 16, 2009 teleconference, only one focused sample location (FF-35) will be sampled. The text has been revised to reflect this.***

CH2M Hill Original Specific Comment #2:
Section: Core Collection and Analysis Page #: 3/4
Samples collected for grain size analysis should not be frozen.

Response: ***Throughout the SRI/FS Area 1 Work Plan (as approved by USEPA) samples are held in frozen storage and later submitted for analyses, including grain size. Continued use of this sample handling method is therefore consistent with prior work and handling procedures, and will be retained here.***

CH2M Hill Original Specific Comment #3:
Section: Schedule Page #: 4/4
"Our current plan is to begin the field activities outlined in this work plan on January 5, 2008." It is assumed the intended date is January 5, 2009.

Response: ***The text will be revised to indicate that the Agencies will be notified 15 days in advance of sampling and analysis activities.***

MDEQ COMMENTS

Comment 1) The ARCADIS work plan narrows the objective to simply collecting "...cores to characterize the PCB concentrations and mass in the areas where PCB were observed in five focused samples."

Response: ***The stated objective in the USEPA-approved Work Plan is specifically to "...characterize the PCB concentration and mass within the deposit" based on the presence and characteristics of the deposit. We have not narrowed the objective, rather, we are following the Work Plan. Based on the lack of presence of a discernable deposit or depositional feature, it would be more logical to not conduct Phase 2 in four of the five areas as Phase 1 does not indicate that***

to be appropriate. As discussed on the March 16, 2009 conference call, the current Work Plan scope will be reduced to include sampling at FF-35 only.

Comment 2) The work plan as currently presented by ARCADIS abandons the concept that sampling in this stretch of the river is premised on the identification of depositional features and designing a specific sampling plan around that feature.

Response: *We have not abandoned the premise – Phase 1 did not identify any depositional features in four of the five areas. See response to comment 1, above.*

Comment 3) Only FF sampling locations were used to identify potential features that needed to be mapped. Higher concentrations of PCB were identified at unbiased transect locations but were not considered for this study. The reason the FF sample locations were singled out for this study is because it was assumed that they were collected from distinct depositional features, where the unbiased samples were assumed to not be associated with a distinct feature. The assumption, that the FF samples for these locations were strictly associated with depositional features, has clearly been disproved with the possible exception of sample location FF-35.

Response: *Agreed.*

Comment 4) The work plan called for pre-probing of FF sample locations (as they were assumed to have been associated with depositional features) in order to "characterize its shape and depositional nature." If this sampling were intended to be a simple step-out exercise, then pre-probing would not be necessary.

Response: *Disagree. The purpose was to identify if a deposit exists, the characteristics of the deposit, and then to use that information to design the sample layout for Phase 2.*

Comment 5) The sample grid layout was left open as indicated by the fact that it "...may be in a radial pattern, a grid-based pattern, or other design, as appropriate and as approved by USEPA, and may not necessarily be geographically centered on the original focused sample location." This points to the fact that it was assumed that the FF samples may not be located in the center of a depositional feature and that the size and shape of the depositional feature could not be understood until after the field reconnaissance was completed. Clearly, the sampling plan was not intended to be a simple step-out sampling exercise; otherwise, what is the purpose of leaving such details open to interpretation for a later date?

Response: *Agreed. As reflected in the layout of the proposed sampling at location FF-35, we do not assume it is in the center of the deposit.*

Comment 6) The concept of identifying and mapping depositional features for this stretch of the river is consistent with the thinking that went into the development of the Portage Creek sampling plan that was developed at the same time. The Portage Creek work plan also called for the mapping of depositional and geomorphic features. The MDEQ believes that this mapping effort was also under-emphasized leading up to the sampling activity.

Response: *We did not observe features that provide any basis for identification or delineation of a deposit at those locations with possible exception of FF-35. It is unclear what is asserted with respect to under-emphasizing the mapping effort. MDEQ's basis for placing these focused samples was not originally based on any confirmation that they represented deposits of interest, so it is not surprising that some of the locations do not appear to represent such deposits.*

Comment 7) It would appear that some of the original assumptions that were made at the time of work plan development (mainly that the FF sample locations were a reliable surrogate for identifying geomorphic deposits) was an erroneous premise. The lack of deposits identified by this field exercise has proven that out. To simply move forward with the development of a sampling plan based on such a false premise is counterproductive to all parties involved.

Response: ***We agree sampling further in these areas does not makes sense, however, note that the Work Plan did not assume the FF samples definitively represented deposits. The approach to sampling these areas was conditional upon the presence of an actual deposit as indicated in the Work Plan. Thus a key part of the question – do these samples represent deposits – was addressed. We agree these results will not be particularly useful.***

Comment 8) A reasonably simple effort could be made to identify deposits/geomorphic features, map them, and develop a sampling plan that will yield a data set that is similar in size but provides more useful information for future decision making.

Response: ***This is what was done. We fulfilled the Phase 1 sampling requirements and further work does not make sense in these areas. Going into other areas other than the five locations identified in the Work Plan and seeking depositional features to sample is outside the scope of the plan and is inconsistent with the Work Plan intent of revisiting the locations of the five highest PCB concentrations in the reach.***

Schedule

In accordance with the scope of work, USEPA will be notified 15 days prior to the expected date of commencing field work and provided with an estimated schedule of field activities at that time. We will coordinate with USEPA to schedule field activity oversight.

Sincerely,

ARCADIS

Michael J. Erickson, P.E.
Associate Vice President

Copies:
Paul Bucholtz, MDEQ
Jeff Keiser, CH2M HILL
Todd Goeks, NOAA
Garry Griffith, P.E., Georgia-Pacific LLC
L. Chase Fortenberry, P.G., Georgia-Pacific LLC
Mark Brown, PhD, Waterviews, LLC
Michael Scoville, ARCADIS
Lisa Tomlinson, EIT, ARCADIS

Enclosure:

Figure 1 – Focused Step-out Sampling Locations

References

ARCADIS BBL. 2007a. *Supplemental Remedial Investigation/Feasibility Study Work Plan – Morrow Dam to Plainwell.* February 2007.

ARCADIS BBL. 2007b. *Multi-Area Field Sampling Plan*. October 2007.

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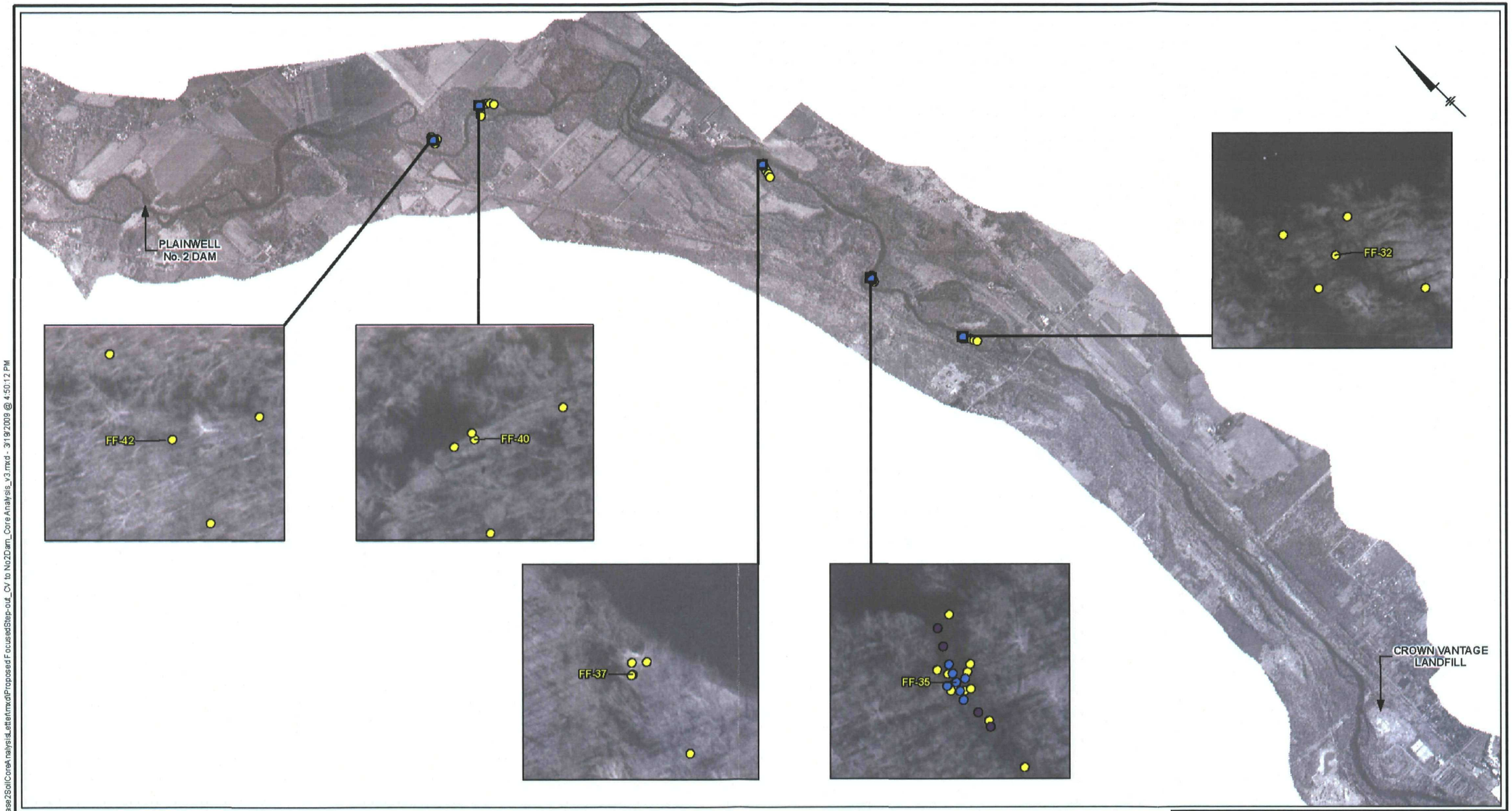
Figure



LEGEND:

- PROPOSED CORE LOCATION FOR ANALYSIS (AS NEEDED)
- NOVEMBER 2007 PROBING LOCATION
- PROPOSED CORE LOCATION

0 2,600 5,200 Feet

GRAPHIC SCALE

0 100 200 Feet

GRAPHIC SCALE FOR INSETS

NOTE:

1. AERIAL IMAGE DERIVED FROM ORTHOGRAPHIC DATA BY AIR LAND SURVEYS, INC., KALAMAZOO RIVER FLOWN 4/24/99, PORTAGE CREEK FLOWN 4/27/00.

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KALAMAZOO RIVER SRI PHASE 2 ANALYSES - FOCUSED STEP-OUT SAMPLING - CROWN VANTAGE LANDFILL TO PLAINWELL NO. 2 DAM

FOCUSED STEP-OUT SAMPLING LOCATIONS

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FIGURE 1

SYR-85 MTK AMB MTK
KRSG (B0064524.0000.0500)
Q:\KRSG\MorrowDam\ToPlainwellDam\SRI_Phase2SoilCoreAnalysisLetter.mxd\ProposedFocusedStep-out_CV to No2Dam_Core Analysis_v3.mxd - 3/19/2009 @ 4:50:12 PM